Water Chestnut (*Trapa natans*) in Maryland

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Background

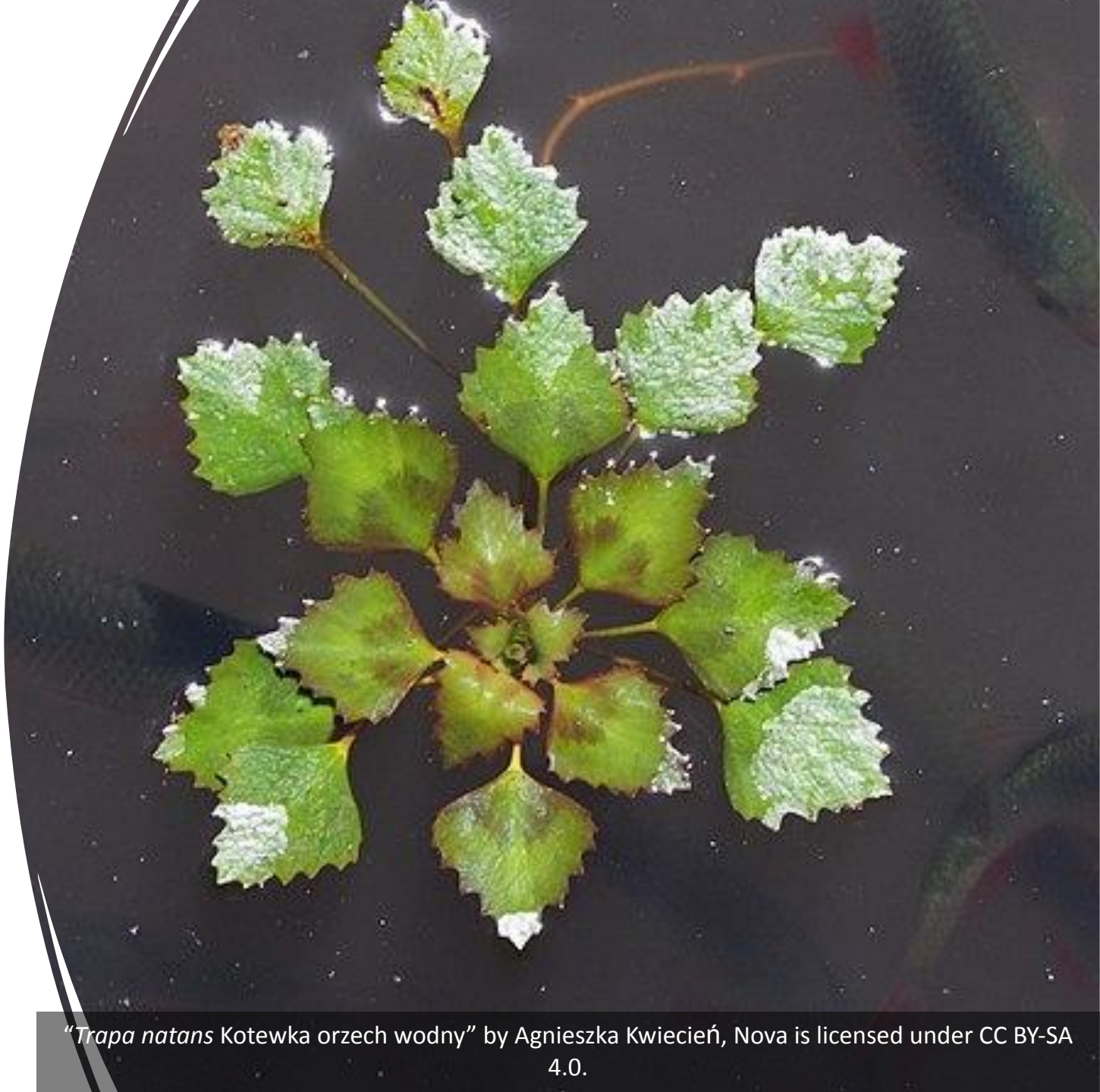
- Dispersal is through hydraulic exchange and animals (Goodwin *et al.* 2008).
- The water chestnut began
  - as a two-acre patch in 1923
  - which grew to 10,000 acres by 1933 (MDNR; Naylor 2003).
- The water chestnut was thought to be contained by the 1960s, but it reappeared in 1997 (MDNR; Naylor 2003).

Problems Associated with Water Chestnut

- The water chestnut is a prolific reproducer which causes recreational issues to boaters (MDNR; Naylor 2003).
- The water chestnut also
  - has spikey seeds (MDNR; Naylor 2003),
  - creates a breeding ground for mosquitos (MDNR; Naylor 2003),
  - displaces native grasses (Findlay *et al.* 2014),
  - creates hypoxic conditions (Teixeira *et al*. 2015), and
  - creates marginal habitat for native fish and birds (Naylor 2003).

Benefits Associated with Water Chestnut

- The water chestnut improves ecosystem function by
  - increasing densities of macroinvertebrates (Strayer *et al.* 2003),
  - supporting dense populations of invertebrates (Kornijow *et al.* 2010), and
  - contributing to nitrogen removal (Tall *et al*. 2011).

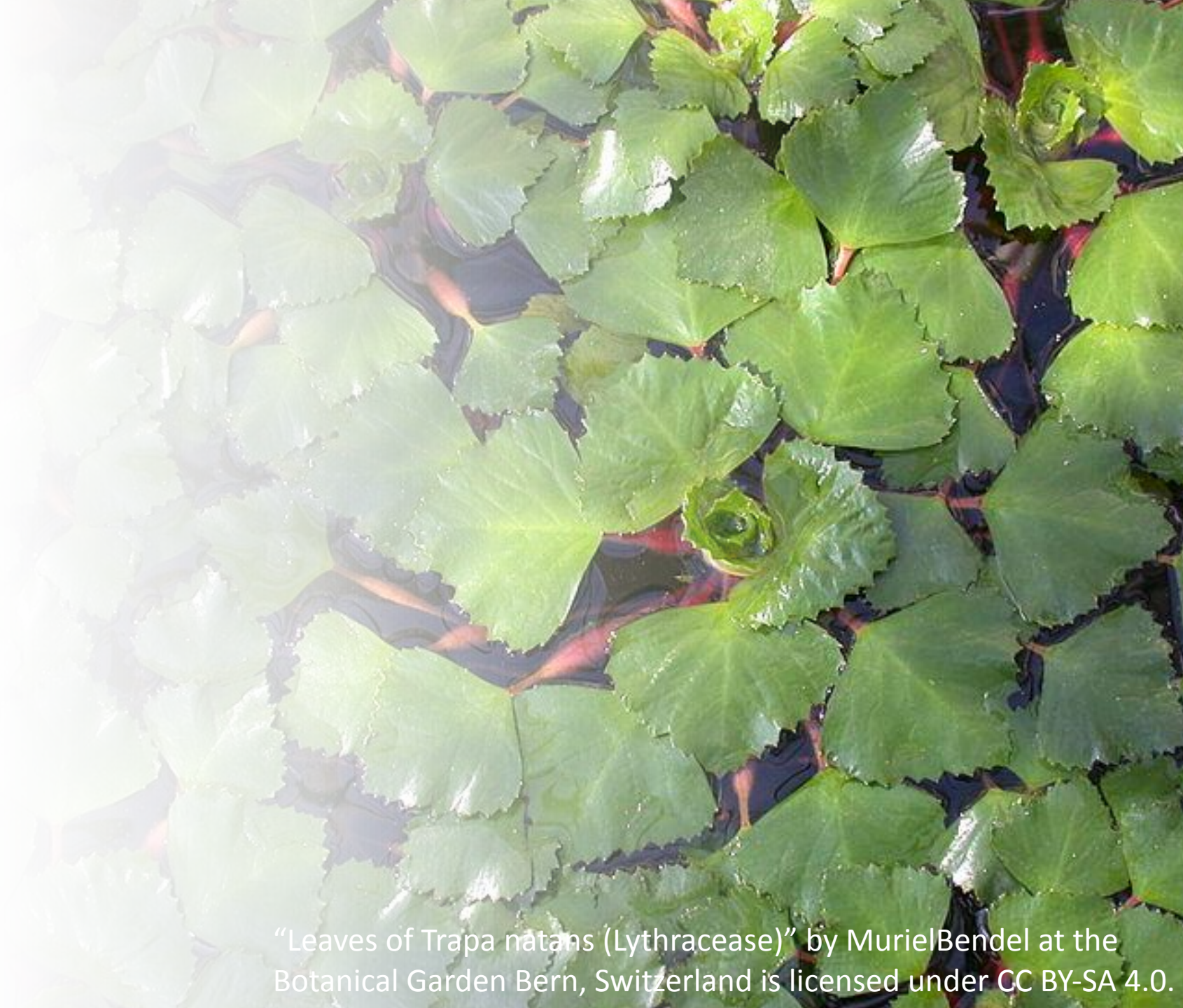


Management of the Species

- The removal techniques that have been used for water chestnut are
  - mechanical harvest,
  - hand removal,
  - floating composter, and
  - herbicide in the 60s (MDNR; Naylor 2003).

Managing Water Chestnuts Currently

- Management of water chestnut is reliant on outside sources to notify if there are new patches including the
  - local community and
  - Sassafras River Keeper (Mike Naylor, personal communication, Sept. 20, 2021).



Recommendations for Improvements: Bird and Sassafras River

- *Trapa natans* is still found in the Bird and Sassafras River (MDNR; Mike Naylor, personal communication, Sept. 20, 2021; Mark Lewandowski, personal communication, Sept. 23, 2021).
- Possibilities as to why water chestnut is difficult in these areas include
  - missed plants,
  - lack of constant monitoring, and
  - lack of funding (Mark Lewandowski, personal communication, Sept. 23, 2021).

Recommendations for Improvements: Public Outreach

- The outreach efforts for invasive species include:
  - educating volunteers,
  - presentations,
  - billboards,
  - boat ramp photos and pamphlets,
  - videos online, and
  - articles (Mike Naylor, personal communication, Sept. 20, 2021; Mark Lewandowski, personal communication, Sept. 23, 2021).
- Is all of this enough?

New Problem Species?

- *Trapa bispinosa*
  - is currently on the Virginia side of the Potomac. (MDNR; Mike Naylor, personal communication, Sept. 20, 2021; Mark Lewandowski, personal communication, Sept. 23, 2021).
  - Nothing can be done from MDNR because it is not in MD (Mike Naylor, personal communication, Sept. 20, 2021).

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